

March 3, 1989

TO: Wayne Hedberg, Permit Lead

FROM: Holland Shepherd, Reclamation Soils Specialist *HS*

RE: Review of January 19, 1989 Submittal, Jumbo Mining Company, Alto-Ibex Mine, M/023/013, Juab County, Utah

Below please find my comments for Jumbo Mining's most recent submittal:

R613-004-106(2) - Operation Practices, Deleterious Materials

Reference Operator's 1.0

The Division will accept the operator's argument for the absence of acid-forming material associated with the waste rock material. However, in reading the Drum Mine, 1983, Mining and Reclamation Plan, it is apparent that alkaline materials may exist in the parent rock. Soil analyses performed at the Drum site indicate high sodium and SAR values at levels 2 to 3 feet below the surface.

The Division requests that the operator evaluate waste material at the Alto-Ibex and Drum sites for sodium and SAR (sodium adsorption ratio). These tests must come from representative samples of the waste material.

R613-004-112 - Variance

Reference Operator's 3.1 - Topsoiling

A variance will be granted for topsoil salvaging at the pits and waste dumps, after field verification, by Division staff, that no topsoil exists in the area to be disturbed. The operator's argument for natural seeding to do the job of revegetation at this site, is not acceptable. The plant species, indicated in the photos are of undesirable plants (weeds). These species are not palatable to wildlife or livestock, do not make good soil binders, do not provide for good wildlife habitat, and do not provide for a diverse, persistent vegetative community. The range condition of these areas would be rated as very poor.

Reference Operator's 3.2

The Division accepts the operator's proposal for pit reclamation. Variances will be granted for highwalls and revegetation associated with the pits. The only requirement will be that pit roads be ripped, fertilized, drill seeded, and imprinted.

Reference Operator's 3.3

The operator's argument that dump slopes, at angle of repose, will be stable over time, is acceptable. However, such slopes will not provide conditions conducive to acceptable revegetation. If it proves too difficult to grade these slopes out to an acceptable planting slope, alternatives may be used. Such alternatives might include the use of mulch/blankets on these slopes to aid in revegetation and prevent erosion. Such a procedure would be more expensive than simply planting, but a lot less expensive than grading to a more gradual slope.

R613-004-107(5) - Operational Practices, Soils

Reference Operator's 6.1

The Division will not require the operator to salvage topsoil where none exists. This will be determined during a Division field visit early this Spring. Waste areas must still be revegetated. If the waste material proves to be deleterious then it must be covered with borrowed material.

R613-004-107(5) - Operational Practices, Soils

Reference Operator's 6.2

The Division will accept the soil survey information, provided in the 1983 Drum Mine Plan, in lieu of another survey to be performed for the Jumbo site. The survey information provided in this plan, indicates that soils in the area range from 6 to 60 inches in depth, depending on topography. If the operator wants to defer to this information, this would indicate the existence of salvageable topsoil in the alluvial valleys associated with the Alto-Ibex site and Drum sites. The possibility of borrowable material therefore exists.

Reference Operator's 6.3

The operator has asked that the Division refer to soils information from the Drum Mine Plan when referring to soils questions. The Drum mine plan does not provide information concerning nutrient or toxicity levels of the waste material. If this material is to be used, without benefit of topsoil, as a plant growing medium, the operator will be required to provide proof that the material is capable of sustaining quality, perennial plants. The operator will be asked to provide the Division with an analysis of the following: nitrate nitrogen, available phosphorous, exchangeable potassium, soil pH, electrical conductivity, texture, sodium adsorption ratio, selenium, and boron.

Reference Operator's 6.31

The photographic evidence, provided by the operator, does not provide conclusive evidence that the material provides a healthy growth medium for plants other than undesirable annuals (weeds). The operator will be required to reclaim the area with adaptable, perennial species, which will support livestock and wildlife grazing/habitat. A field visit to the site, by Division staff, will help to alleviate this issue.

Reference Operator's 6.32

The Division concurs with the operator's rational that borrowing topsoil from other areas will cause greater disturbance than disturbing only one area. However, if the waste material proves to be deleterious, the Division will require that good material be borrowed from another area of the site to cover the wastes.

Reference Operator's 6.4

The operator will be required to reclaim any areas disturbed at the site, even those disturbed pre-law (post May 1975). The operator however, will not be expected to retopsoil these areas. It would benefit the operator to designate, on a map, those areas to be redisturbed. A revegetation variance can be requested for these areas, otherwise the operator will be expected to meet the 70% standard prior to bond release.

R613-004-111(13) - Revegetation

Please change *Chrysothamnus nauseosus*(rabbitbrush) in the recommended seed mix to *Chrysothamnus viscidiflorus*. According to the Drum Plan, this species of rabbitbrush is better adapted to the conditions of this site.

Reference Operator's 11.1

The Division will not allow natural invasion or revegetation of any area of the site other than the pit high walls and benches at the Alto-Ibex site. Even on areas where a variance has been requested the operator will be expected to seed, but will not be expected to meet the 70% revegetation standard.

Reference Operator's 11.2

The Division will require, depending on the results of waste material analyses, that the operator rip, mulch, fertilize, and reseed the tops of the waste dumps. This is particularly true if no topsoil is to be applied.

Reference Operator's 11.3

It is doubtful that the operator's test plot will produce the type of results necessary to determine an acceptable revegetation methodology for this site or the Drum site. Our suspicion is that the waste material alone will provide for a healthy, weed infested vegetative community. Desirable species will find it difficult, if not impossible, to gain a foothold in such an environment. If nothing else, it will make a good control plot to compare with other plots. The operator needs to develop several different test plots, using different soil amending procedures. By doing so, we will be able to determine the most reasonable approach to reclaiming a good vegetative community on the site.

R613-004-111 (12) & (13) - Topsoil and Revegetation

Reference Operator's 12.1

The argument for natural reseeding of areas at this mine site or the Drum site is not acceptable. The operator will be expected, at a minimum, to rip and reseed areas at the site accessible to reclamation equipment. This might include benches and roads in the pits themselves. A field visit will be made to the site this spring to verify any such Division requirements.

R613-004-111(12)

Reference Operator's 14.3

Western States Mineral's, approved 1983 Mining and Reclamation Plan, indicates that areas to be reclaimed will be covered by 6 inches of topsoil. The plan also indicated that approximately 30,000 cubic yards of topsoil would be salvaged at the site. This is enough topsoil to cover 37 acres to a depth of 6 inches. The actual amount of topsoil salvaged by Western States Minerals was only 10,000 cubic yards. This is enough topsoil to cover 12 acres to a depth of 6 inches.

According to Division reclaimable acreage calculations, 130 acres exist at the Drum site. If 12 acres is subtracted from 130 acres, this leaves 118 acres of material that must be reclaimed without benefit of topsoil. If the operator is going to be able to meet our final bond release requirements on this acreage, then it will be necessary to amend this material or borrow the needed topsoil material.

At a minimum, the Division will require that the operator, or Western States Minerals provide the extra 20,000 cubic yards of topsoil material, committed to in the 1983 permit. This material will have to be borrowed from an adjacent area of the site. This commitment must be met before any further development takes place at the site or Western States Mineral's reclamation bond is released.